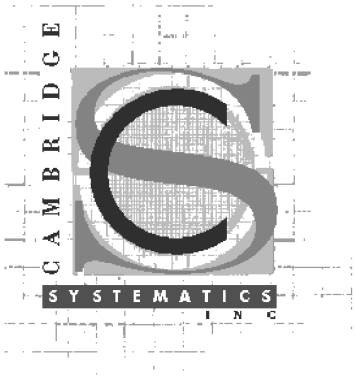


# Overview of Key Information Resources and Outline of Planning Information Management Framework for the Georgia Statewide Transportation Plan and Process

# final technical memorandum

*submitted to*

**Georgia Department of Transportation**

*submitted by*

**Cambridge Systematics, Inc.**

*with*

Day Wilburn and Associates, Inc.
Cooper Consulting, Inc.

*December 1999*

*final technical memorandum 2.1*

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# Overview of Key Information Resources and Outline of Planning Information Management Framework

## 1.0 Introduction

This memorandum covers workplan subtask 2.1 – "an issues framework for use in evaluating the usefulness of existing data and tools in meeting the needs for this project." This memo is preparatory to the completion of the subtask 2.2 technical memorandum – "an inventory of existing data sources and tools." The team is reviewing existing data resources to identify key information assets for use in the project. Part of this effort is to prepare a framework for identifying and analyzing the usefulness of the resources. Once these have been itemized, the consultant team will prepare a summary of the different resources outlining their key characteristics, use and usefulness, and any strengths or limitations of the information resource. Since this memorandum is partly organized by the GDOT staff and managers whom we interviewed on December 1-2, it also serves as the meeting minutes for the technical sessions conducted during the kickoff meetings. This and subsequent memoranda will lead to an information systems plan to support the issues, analyses, and policies at the core of the Statewide Transportation Plan itself.

## 2.0 Background

Cambridge Systematics (CS) team members visited the Department on December 1 and 2, 1999 to conduct interviews with a number of staff members to review the planning data and tools currently in use. As preparation for this visit, the CS team prepared a questionnaire which was used to guide the discussions. A copy of the questionnaire is attached to this memo as Appendix A. In brief, the questionnaire sought to address the following key information systems issues:

- Resource name;
- Content;
- GDOT purpose;
- Current status;
- Responsible parties in GDOT (division, individuals);
- Usefulness for the SWTP project; and
- Accessibility.

The initial interviewees were very helpful in identifying other GDOT staff and consultants who manage potential SWTP information resources. These staff will be contacted in the near future to obtain more detail about their systems.

A key finding from the interview effort was that the TIS is not very likely to play much of a role in the SWTP effort because it will not be available until mid-2001, but that the consulting team must consider how the TIS can support the SWTP process in the future.

An outline of the results of the staff interviews, organized by system or type of information, is shown in Table 1.

# Table 1. Systems and Data Resources Overview

| Systems/Data Resources | Source/Contact | Current Status | Notes | Next Step |
|---|---|---|---|---|
| ***Asset Management*** | *CS Team Leader: Allen Marshall* | | | |
| Bridges – BRIMS and Pontis | Bridge Office, Norm Cressman, Ted Kowal | Standard bridge inventory and condition information available. | Pontis not used for needs generation, but planned. Condition data collected at element level. | Contact Bridge Office |
| Pavement | Norm Cressman | TBD | | Contact Mr. Cressman for summary of capabilities, determine need for PMS needs forecasts. |
| Roadway Characteristics (RC file) | OIS (Tim Christian, John Crown) | Documentation available from OIS. This is a data retrieval system. | This is the comprehensive road inventory. | Contact OIS. Determine process for obtaining relevant roadway characteristics. |
| HPMS | OIS (Tim Christian, John Crown) | Information available on Federal report/tape, extract from RC file. | Standard HPMS data available. | Determine relevance of HPMS to SWTP, evaluate need for HPMS forecasts. |
| ***Travel Demand Forecasts*** | *CS Team Leader: Dan Beagan* | | | |
| Traffic Count System | OIS (Tim Christian, John Crown) | Traffic information is available from data retrieval system. Selected traffic information can be mapped. | ADT counts are only accurate within five years, and may require significant updates for SWTP planning needs. | Contact OIS. Evaluate accuracy and completeness of traffic count information. |

# Table 1. Systems and Data Resources Overview (continued)

| Systems/Data Resources | Source/Contact | Current Status | Notes | Next Step |
|---|---|---|---|---|
| ***Travel Demand Forecasts (continued)*** | | | | |
| Urban Area Forecasts | Office of Planning: Urban Area Planning Bureau (Chris Simons) | GDOT has functioning Travel Demand Forecasting Models in each of the 12 MPOs. GDOT maintains 10 of the TDF models. ARC maintains the Atlanta model. TnDOT maintains the Georgia portion of the Chattanooga model. | Models are three-step models (excluding mode choice) in all regions except Atlanta. Most models produce only daily highway volume forecasts. All produce highway volumes by link and revised link speeds. Most models either produce or will soon produce 2025 forecasts. The software used is TP+ or TRANPLAN. | Obtain Trip Generation Equations from GDOT. Evaluate methods to simplify and standardize forecasts for use in SWTP. Explore methods to expand simplified procedures to rural areas. |
| Commuter Rail Model | Office of Intermodal Planning (Larry Saben, PBQ&D) | TDF model for ridership projections in 50-county area centered on Atlanta. | Model only forecasts home-based work trips. | Determine consistency with Urban Area forecasts. Determine suitability for use in SWTP. |
| InterCity Rail Model | Office of Intermodal Planning (Larry Saben, PBQ&D) | GDOT has model developed for 1996 Intercity Rail Passenger Plan. Being used by PBQ&D under contract to GDOT. | Model forecasts intercity (60+ mile) passenger trips for auto, air, bus, and rail. Assigns trips to rail network. Highway network not used. | Determine consistency with Urban Area forecasts. Determine suitability for use in SWTP. |
| HPMS Analysis Package | Office of Planning (Janet Harvey) | FHWA's HPMS Analysis Package produces VMT forecasts. Could be used to help project VMT. | HPMS Analysis Package was only used previously in development of 1995 SWTP. Forecasts are trend-based only. | Document usage. Probably unsuitable for SWTP update. Consider use for comparison with 1995 SWTP. Need to review data and make sure it provides a comprehensive assessment of VMT. |

# Table 1. Systems and Data Resources Overview (continued)

| Systems/Data Resources | Source/Contact | Current Status | Notes | Next Step |
|---|---|---|---|---|
| ***Travel Demand Forecasts (continued)*** | | | | |
| MTPT | Office of Planning (Ulysses Mitchell) | Forecasting of traffic volumes is one component of MTPT. | Product still in testing. Forecasts made by trend analysis. | Determine if forecasting procedure can be made sensitive to economic variables. |
| ***Air Quality*** | *CS Team Leader: Jack Henneman (Day Wilburn)* | | | |
| Regional mobile source emission models | Bob Bowling, Cora Cook, Chris Simons | Only Atlanta has a working emissions model. In anticipation of the eight-hour standard, GDOT has developed models that can be used with the other metropolitan area travel demand models. | DOT provided the TRANPLAN code. Should monitor to ensure consistency with any EPD attainment assumptions. | Review the TRANPLAN set-ups to understand the model process. Should be very similar to ARCs process. Should discuss with Chris Simons the development of emission factors when appropriate. |
| ***GIS*** | *CS Team Leader: Anthony Kroon* | | | |
| Mapping | Tracy Leet | Comprehensive mapping coverages available for use. | GDOT resources are excellent, mostly used for mapping. Almost any type of roadway data can be mapped. GDOT is sharing responsibility for developing the GIS layers with other state agencies; a multi-agency GIS coordinating committee is responsible for overall statewide development. The GIS system has layers for most transportation modes; the highway layer is the only one with significant underlying data (GDOT's RC files). As of this time, GDOT's many other databases are not accessible through the GIS, and responsibility for database maintenance rests with the individual offices. | Contact Ms. Leet of GDOT and Georgine Geary of the GIS Coordination committee. Need to obtain contact information. |

# Table 1. Systems and Data Resources Overview (continued)

| Systems/Data Resources | Source/Contact | Current Status | Notes | Next Step |
|---|---|---|---|---|
| ***Intermodal Systems*** | *CS Team Leader: Alan Myers* | | | |
| Ports | Georgia Ports Authority, U.S. Army Corps of Engineers | To be collected. | CS will work directly with the Georgia Ports Authority to obtain commodity flow and facility capacity data for GPA facilities, along with whatever GPA has collected on landside traffic volumes by truck and rail (expected to be limited). GDOT will accept GPA's figures. CS will obtain U.S. Army Corps of Engineers data on total waterborne movements through the greater Port of Savannah District and estimate non-GPA volumes by subtracting GPA data from the USACE totals. The data on non-GPA facilities will not be disaggregated unless there is a compelling reason from the standpoint of a potential policy or project of statewide significance. | Establish contacts with GPA and USACE |
| Rail – GDOT State Rail Program | GDOT State Rail Program office, private rail carriers (NS, CSX, Savannah State Docks, Georgia shortlines) | To be collected. Copies of GDOT State Rail Program available. | CS will work directly with NS, CSX, Savannah State Docks and the state's other shortlines to obtain corridor-specific and facility-specific volume data where available. GDOT will make available a variety of rail-related reports, databases and models, and will facilitate coordination with the ongoing State Rail Program. | Identify GDOT rail liaison, industry contacts. Educational outreach may be necessary to enhance industry cooperation. |

# Table 1. Systems and Data Resources Overview (continued)

| Systems/Data Resources | Source/Contact | Current Status | Notes | Next Step |
|---|---|---|---|---|
| *Intermodal Systems (continued)* | | | | |
| Truck/CVO | GDOT, MPO Forecasts, Georgia Motor Trucking Association, secondary sources | To be collected. | The state's designated system of NHS routes and intermodal connectors will be used as the defined baseline truck network. To supplement the general commodity flow databases, CS will utilize GDOT and MPO truck forecasts (to the extent these have been developed), way station information, permit enforcement division data, information from the Georgia Motor Trucking Association and prior truck studies from ARC and other regions as available. | CS will initiate contact with Georgia Motor Trucking Association to identify sources. |
| Intermodal Management System | Luke Cousins | Under development, not available yet. | | Monitor status. |
| Atlanta Hartsfield Strategic Plan | Hartsfield Airport planning staff | | | CS will establish contact with Hartsfield International planning staff to obtain. |
| Airport – plans for general aviation and freight, except Atlanta Hartsfield, can be found in GDOT Aviation Systems Plan (MS Access database) | | To be provided to team. | GDOT will provide information on all airports except Hartsfield from its Aviation Systems Plan (which includes freight and passenger forecasts) and MS Access database. | CS will contact GDOT aviation group. |

# Table 1. Systems and Data Resources Overview (continued)

| Systems/Data Resources | Source/Contact | Current Status | Notes | Next Step |
|---|---|---|---|---|
| ***Planning & Programming*** | *CS Team Leader: Hyun-A Park* | | | |
| TPRO | OIS (Ted Kowal, Mike Cousins), Office of Programming | In testing mode only, online in early to mid-2000 timeframe. | Provides comprehensive project management capability. Part of TIS released early. T-Pro has been developed to address project tracking needs; this has been specifically tailored for the Office of Programming. The initial release of T-Pro was described as somewhat "rushed," and the software is not viewed as optimally designed. A new release of T-Pro is due in February; it will incorporate a relational database structure. | Monitor status. |
| ***Public Communications*** | *CS Team Leader: Connie Cooper (Cooper Consulting)* | | | |
| GDOT Web site | Office of Communications, OIS | Redesign effort underway, Web site is operable as-is for next year or so, links available. | No obstacles to establishing a SWTP Web site link on the GDOT Web site were identified. Existing projects use these links to point to project Web sites, usually hosted by contractors. | Develop initial Web site plan (underway), submit to GDOT for approval. Ask for SWTP link on GDOT Web site. |
| Mailing lists | Office of Planning, Office of Communications | There are numerous public outreach databases, with names, addresses, phone numbers, etc. Most are in Microsoft Access or other PC database formats. | | The various mailing lists will need to be consolidated and enhanced for project use, including adding categorization fields and eliminating obsolete and redundant records. A facility will need to be developed for maintaining the lists. |
| 800-Number | Office of Communications | In use for interchange renumbering project. | May be adaptable to include SWTP menu branch. | GDOT Planning to coordinate with Office of Communications. |

# 3.0 Information Resources and Analysis Requirements Framework

The project framework for managing information resources and analysis requirements will organize the various data sources in the following manner:

- Classified SWTP information requirement, organized into detailed categories;
- Sources – primary and secondary;
- Usability/reliability;
- Processing requirements/analysis methods/tool development; and
- TIS impact, when applicable.

The sources of information must be organized according to their importance to the project, as opposed to their current GDOT organizational context. In most cases, specific information requirements may be fulfilled by several existing systems spanning different parts of GDOT. The framework provides a mechanism to establish the project role for various types of information and, as information sources are identified and evaluated, the framework will identify information gaps and tool development needs which must be addressed for the SWTP effort.

## TIS Impact

An effort will be made to identify potential impacts on the TIS which should be considered if the TIS is to support the next statewide plan development effort. It is evident that the next SWTP effort will need to rely on a centralized set of information resources – the planned role and a key justification for the TIS – so this project must lay the groundwork even if the TIS is not a resource in the short-term.

An outline of the framework with a preliminary example is shown in Table 2. This information resource map will evolve during the life of the project, and supporting documents will elaborate on the table summaries.

## Table 2. SWTP Data and Analysis Requirements Framework Sample

| Information Need | Sources | Usability/ Reliability | Processing Requirements/ Tool Development | TIS Impact |
|---|---|---|---|---|
| Future Highway Volumes | Urban Area Models (within MPOs) | Consistent with local transportation planning and air quality forecasts. | Models operated by GDOT; tool needed to transfer forecasts to other databases. | Better forecasts to be used in design, prioritization, etc., than existing trend projections. Sensitive to economic forecasts. |

# Appendix A
# Discussion Guide for Technical Kickoff Meetings (December 1-2, 1999)

## General

1. Please provide us with a general description of the statewide network and computing resources?

2. Please provide us with a description of GDOT's software standards?

3. Is there a statewide project tracking/management system? Who is responsible for this? Does the STIP exist electronically? Who maintains it?

4. Can we identify a group of GDOT stakeholders to function as regular advisors to the project?

5. What is the status of the evolving relationship between GDOT and GRTA in regard to statewide planning issues?

## Travel Demand Forecasting Tools

In order to develop the Georgia Statewide Transportation Plan and Program, the performance of the transportation system will be tested for several economic development forecasts. Evaluation measures will be developed and calculated for each set of forecasts. The evaluation measures that were presented for illustrative purposes in the Scope of Work for the Plan include:

| Transportation System Component | Evaluation Measure |
|---|---|
| Roadways and Bridges | • Congestion levels<br>• Vehicle miles traveled<br>• Number of accidents<br>• HPMS Composite Index Score |
| Public Transit (including intercity bus) | • Annual revenue passenger trips<br>• Annual vehicle miles<br>• Annual revenue miles |
| Railroad | • Annual gross tonnage accommodated<br>• Daily train volumes |

| Transportation System Component | Evaluation Measure |
|---|---|
| Aviation | • Total annual enplanements<br>• Annual air trips per service area population<br>• Total annual cargo tonnage handled |
| Ports and Waterways | • Total annual cargo tonnage handled (container and bulk)<br>• Annual import/receipts and export/shipments volumes of all commodities<br>• Annual number of truck movements<br>• Annual number of train movements |
| Bicycle and Pedestrian | • Annual number of non-motorized trips<br>• Annual mode share |

The use of these evaluation measures presumes the ability to produce specific transportation demand forecasts related to the economic projections. We need to establish the tools, available to GDOT, that can be used to produce these transportation forecasts. In order to evaluate how these models could be used, it would be useful to determine certain information about them. Among the questions we should consider are the following:

1. What Travel Demand Forecasting (TDF) models are available at the state or regional level?

2. Who maintains/operates each TDF model?

3. What geographic area does it cover?

4. How would the model be best characterized? (a sketch planning tool, a time-series model, a four/three-step model, etc.)

5. At what zonal level does the model store data and produce basic forecasts? (County, census tracts, census block groups, etc.)

6. What basic socioeconomic data does the model use? (Population, households, employment by class, etc.)

7. For what years is basic data available? (current year, horizon year, intervening years)

8. What information is available for the transportation infrastructure? (aggregate information, network level, link level, etc.)

9. What modes of transportation does the model consider? (highway, transit, freight, non-motorized, etc.)

10. For what time periods does the model produce forecasts? (average day, peak times of day, seasonal, etc.)

11. What is the specific nature of the forecasts? (highway volumes by link, highway volumes by functional class, origin-destination tables, tons of commodities carried, transit ridership, etc.)

12. How does the model consider congestion in making its forecasts? (iterative feedback, a priori assumptions, etc.)

13. How has the model been calibrated/validated? How recently?

14. How has the model been used?

15. How consistent are the forecasts of the model with other TDF models?

16. If the model is regional, how transferable would the model be to other areas of Georgia?

## GDOT-Specific Tools

### TIS (Oracle, ArcInfo/ArcView interfaces, Queries/Display of Roadway, Traffic, Accident, Intermodal Data)

1. What are the key technical descriptors of the TIS (software program, etc.)?

2. What is the status of map/coverage development for the TIS? Which are complete, which are being tested, which are being developed, and which are not yet in development?

3. Which of the primary GDOT databases (e.g., RC file, traffic counts, accidents, bridge inventory, HPMS, etc.) are currently accessible through the TIS?

4. If not currently accessible through the TIS, what is the current schedule for final development?

5. For databases not accessible through the TIS, how will the team have access to the information?

6. What type of analytical routines have been (or will be) developed to "manipulate" base information in the TIS?

7. Can we get a copy of the current data model?

8. What is the current schedule for implementation (key milestones and dates)?

9. What design documents exist (need copies)?

### MTPT (Supports Multimodal Planning in Rural Areas; Prioritization of Needs by Mode; Roadway Project Evaluation; GIS Interface)

1. What is the status of internal and external testing of the MTPT?
2. What comments and concerns have been raised during testing?
3. When is Georgia Tech due to deliver a final product?
4. What are GDOT's expectations and/or desire for the level to which the MTPT will be used for the statewide plan?
5. Who is the current GDOT contact for MTPT development, testing and maintenance?
6. What does GDOT view as particular strengths of the MTPT?
7. Can we get a copy of the current data model and system documentation?
8. Has the ODBC connection been tested yet, so that MTPT can work with the new TIS relational database structure?

## ■ Asset Management Systems/GIS

### BIMS/Pontis

1. What data elements are included beyond the required NBI items (get data schema)?
2. When is GDOT planning to generate bridge needs/projects from Pontis?
3. Who is responsible for this system?

### Pavement Management System

1. Who is responsible for maintaining this application?
2. Can we get a copy of the current data model and system documentation?
3. Is this system used to generate needs/pavement projects? If so, how?

### Road Characteristics File (RC)

1. Who is responsible for maintaining this data?
2. Can we get a copy of the documentation?

3. How accurate/current is the data?

4. What process is used to keep it current?

## IMS (Intermodal Management System)

1. Who is responsible for maintaining this application?

2. Can we get a copy of the current data model and system documentation?

3. Are there any plans for expanded capabilities?

## GIS Coverages (State, Local)

1. Is there a statewide GIS plan (need copy)?

2. What agency has primary responsibility for GIS in Georgia (need contact person)?

3. What coverages exist (IMS, MTPT, TIS, other?)

## HPMS

1. Is the Analytical Package used to generate needs? If not, has GDOT ever explored this?

2. Who at GDOT is responsible for maintaining the HPMS database?

## Data Collection Program

1. Please describe the data collection program that supports information in each primary database (who collects the data, how frequently, is sampling used? etc.)

2. Are the 1998 traffic counts available? When are the 1999 counts expected to be available?

3. When were the most recent surveys (intercepts, stated preference, interviews, etc.) performed for GDOT? Can we have access to the raw survey data?

4. What freight data (e.g., commodities, weights, values, routes, truck counts, etc.) are collected?

# Intermodal

## General

1. Can we obtain GDOT, Georgia Ports Authority (GPA) and U.S. Army Corps of Engineers reports pertaining to port and rail infrastructure and planning? GPA has a number of planning studies for its terminals at Garden City and Ocean Terminal (Savannah) and Brunswick, some of which may be in "unpublished draft" form. The Corps studies of most interest would be relating to the 42-foot and 45-foot channel deepening projects for the Savannah River.

2. How detailed is the roadway network? Does it vary by region? For freight, basically we would like to include all (within reason) designated truck routes, which should be available from city/county/MPO maps.

3. The role of private ports in Savannah is especially critical, as they handle nearly 50 percent of the tonnage through that Port District. There is only one private common carrier port (the rest are industries such as Union Camp, Savannah Sugar, etc., with dedicated docks) but it views the Port of Savannah and the state with some trepidation. The Chatham County Intermodal Freight Study has some useful info on the major shippers and receivers of waterborne freight.

4. For waterborne volumes, I would suggest a methodology that uses (in priority order): 1) public port data at a terminal-specific level; 2) interviews with major private port operators; then 3) aggregate data (Waterborne Commerce of the U.S.), from which we would subtract (1) and (2) to get at the remainder. Is this acceptable?

5. We will have good info on commodity-specific volumes for GPA, but less so for the private terminals (many of whom view this information as business-sensitive). At what level of disaggregation is this information wanted?

6. Annual truck moves will need to be calibrated from GPA and private terminal gate counts, where this data is obtainable, or from translating commodity volumes (where obtainable) into vehicle equivalents. Again, the level of disaggregation is critical, as this gets pretty complicated and less reliable when we take it down to individual facilities.

7. Train moves will be obtainable from the railroads, although exact numbers of railcars will require the input of individual customers if that is the desired level of detail.

## Intermodal Databases

1. What modal coverage exists within the intermodal databases?

2. What is the content of each database (e.g., existing conditions, usage, planned projects, etc.)?

3. In what format does each database currently exist (Excel, etc.)?

4. Who is responsible for maintaining each database?

5. How old is the information in each database?

6. What type of analysis/manipulation mechanism exists for each database?

7. What freight data (e.g., commodities, weights, values, routes, truck counts, etc.) are collected?

### IMS (Intermodal Management System)

1. Who is responsible for maintaining this application?

2. Can we get a copy of the current data model and system documentation?

3. Are there any plans for expanded capabilities?

## ■ Air Quality

1. What is GDOT's perspective on the eight-hour standard and how are they preparing for it – specifically in terms of GRTA and developing mobile source emission inventories?

2. How is GDOT preparing technically (AQ modeling, demand models, SIP development and inventories, etc.) for expansion of nonattainment areas statewide?

3. How is GDOT interacting with EPD regarding the development of SIP emission inventories – focus on the role of HPMS and the impact on mobile source emission budgets?

4. Discuss the potential conflict in roles and responsibilities between GRTA, GDOT and EPD in transportation planning in the nonattainment areas.

## ■ Public Participation

1. Should we use the existing stakeholders group for this project as is, or should we seek to expand it? If so, do you any specific individuals or groups in mind, or a process for expansion?

2. What existing public participation processes should we seek to link up with?

3. What should be the sequencing of stakeholder and general public meetings in the context of the scope of work?

4. Does GDOT have any specific outreach strategies, media, etc., which they would prefer we use?

5. Who is responsible for the GDOT Web site? Is it possible to link this project directly into it?

6. What public Internet forums related to statewide transportation are available at the present time?

7. Does the state have an 800-number? Can we link into it for this purpose? Alternately, can we use the existing CS 800 number and create a special mailbox?

8. Can GDOT provide any in-house support for copying and postage?